IV.J.5 Direct Methanol Fuel Cell Prototype Demonstration for Consumer Electronics Applications (New Project)

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Subcontractors:
Flextronics
Methanol Foundation
Dupont Fuel Cells

Objectives

- Design, develop, optimize and validate direct methanol micro fuel cell technology for consumer electronics applications.
- Three generations of prototypes will be developed for use in handheld mobile computers and smart-phones.

Technical Barriers

This project addresses the following technical barriers from the Fuel Cells section of the Hydrogen, Fuel Cells and Infrastructure Technologies Program Multi-Year Research, Development and Demonstration Plan:

- O. Stack Material and Manufacturing Cost
- P. Durability
- Q. Electrode Performance

Approach

MTI Micro has worked on developing proprietary direct methanol micro fuel cell power system technology and products. These systems include a fuel cell subassembly, fuel cartridge, fuel delivery, DC-to-DC converter, and packaging. MTI Micro has built a number of prototypes demonstrating size reductions, performance improvements, the ability to operate in any orientation, operation at a range of power outputs and, most recently, the use of 100 percent methanol fuel – eliminating the need to carry water in the fuel cartridge or to pump it from the cathode and thereby achieving higher energy density. A critical remaining requirement for commercialization is low-cost mass-manufacturing technology for micro fuel cell assemblies. This proposal addresses the development and demonstration of such technology.

Flextronics, a global leader in electronics manufacturing services, will assist MTI Micro in the vital work of optimizing mass-manufacturing techniques for fuel cell arrays and stacks. Another area that is critical to successful commercialization of fuel cells is assuring compliance to all relevant codes and standards, as well as federal regulatory provisions. For this, MTI Micro will secure the research and policy analysis services of the Methanol Foundation, a non-profit educational and scientific organization dedicated to the use of methanol as a clean energy resource. DuPont will assist MTI Micro with further optimization and supply of membrane electrode assemblies.